

## NISTTech

### NONCONTACT METROLOGY PROBE, PROCESS FOR MAKING AND USING SAME

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**Docket: 14-041**

#### **Abstract**

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Presented here is a new and novel laser tracker target for measuring, in three dimensions (3D), the spatial location of small features, which are on the order of tens of microns, on a physical object without having to actually physically touch or make contact with the object under inspection. The system uses a multi-camera approach to generate a virtual point in space that is co-located with the centroid of a spherical mirror reflector target (SMR). The cameras are used to determine the center of the SMR. The center of the SMR is also simultaneously measured by a laser tracker system thus linking this virtual point in space to the laser tracker coordinate system. This system vastly extends the capability of current laser tracking systems to be able to perform touchless high precision spatial metrology to the tens of micron level. This capability is not currently achievable with laser tracker targets. Furthermore, this system provides a direct link of touchless 3D spatial data to a laser tracker coordinate systems and thus is a considerable advancement in laser tracker target technology. The uses for this touch-less high resolution 3D spatial metrology system are numerous and include but not limited to: more accurate robot calibration for advanced manufacturing, precision determination of tooling position such as is needed for precision drilling in automotive and aerospace applications, and high frequency antenna alignment.

#### **Status of Availability**

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This invention is available for licensing exclusively or non-exclusively in any field of use.

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